

CLAIMS

1. An apparatus (301, 314, 351) for cutting turf, for soil de-compacting and for soil drainage and irrigation, the apparatus (301, 314, 351) comprising a chassis (1) have ground engaging means (5, 61), an adjustable working arm (3) having a chassis-engaging end (302) movably mounted on the chassis (1) and a tool-engaging end (303) having means for receiving a tool, means for oscillating the tool-engaging end (303) of the adjustable working arm (3) wherein the oscillating means comprises a drive means mounted on the chassis (1) and a connecting means mounted intermediate the drive means and the adjustable working arm (3).
2. An apparatus (301, 314, 351) as claimed in claim 1, wherein the connecting means is a single connecting rod (2).
3. An apparatus (301, 314, 351) as claimed in claim 1 or claim 2, wherein the drive means is a camshaft (11).
4. An apparatus (301, 314, 351) as claimed in any one of the preceding claims, wherein the chassis-engaging end (302) of the adjustable working arm (3) is pivotally mounted on a housing (27) which is movably mounted on the chassis (1).
5. An apparatus (301, 314, 351) as claimed in claim 4, wherein the housing (27) is a depth-set housing which is movable along a substantially vertical axis for adjusting the depth of a tool relative to the surface of the ground.
6. An apparatus (301, 314, 351) as claimed in any one of the preceding claims, wherein the ground engaging means comprises at least one axle (8) carrying wheel means thereon, the apparatus (301, 314, 351) being pivotable about the axle (8) to allow the tool to be raised clear of the ground when out of use.
7. An apparatus (301, 314, 351) as claimed in any one of the preceding claims, wherein the ground engaging means comprises a pair of axles (8, 14), an aft axle (14) adjacent the tool engaging end of the adjustable working arm (3) and a forward axle (8) and at least one axle carrying wheel means thereon.

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8. An apparatus (301, 314, 351) as claimed in any one claims 7 or 8, wherein the apparatus is pivotable about the forward axle (8) to allow the tool to be raised clear of the ground when out of use.
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9. An apparatus (301, 314, 351) as claimed in any one of the preceding claims, wherein the tool is a turf cutting knife (305) comprising a turf undercutting blade (10).
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10. An apparatus (301, 314, 351) as claimed in claim 9 when dependent on claim 7, wherein the turf undercutting blade (10) is disposed substantially vertically below an axis of rotation of the aft axle (14).
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11. An apparatus (301, 314, 351) as claimed in claim 9 or claim 10, wherein the turf undercutting blade (10) is reinforced.
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12. An apparatus (301, 314, 351) as claimed in any one of claims 9 to 11, wherein the turf cutting knife (305) comprises a turf undercutting blade (10) and a turf side-cutting blade (9) extending upward and rearward from each lateral edge of the turf undercutting blade (10), the side cutting blades (9) having mounting means on their free ends for mounting the turf cutting knife (305) onto the tool receiving means of the adjustable working arm (3).
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13. An apparatus (301, 314, 351) as claimed in any one of the preceding claims, wherein the tool receiving means comprises a crossbar (4) mounted on the tool-engaging end of the adjustable working arm (3).
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14. An apparatus (301, 314, 351) as claimed in claim 13 when dependent on claim 12, wherein the mounting means of the turf cutting knife (305) comprise brackets (13, 13a) extending from the side cutting blades (9) and the brackets (13, 13a) have means for releasably fastening the turf cutting knife (305) to the crossbar (4).
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15. An apparatus (301, 314, 351) as claimed in claim 14, wherein a range of turf cutting knives (305) are provided with brackets (13, 13a) of different lengths to accommodate blades (10) and/or wheels (5) of different widths.

16. An apparatus (301, 314, 351) as claimed in claim 12 to 15, wherein the side cutting blades (9) are disposed laterally along the outside of the ground engaging means.

5 17. An apparatus (301, 314, 351) as claimed in any one of the preceding claims, wherein a guillotine is mounted on the aft portion of the chassis (1) of the turf cutting apparatus and is operable between an out of use position where a cutting head (101) of the guillotine is clear of the ground and an in use position where the cutting head (101) slices vertically down into a strip of cut turf to produces strips of turf of a predetermined length.

10 18. An apparatus (301, 314, 351) as claimed in claim 17, wherein the guillotine is operated between its two positions by guillotine drive means taken off the main turf cutting apparatus drive means.

15 19. An apparatus (301, 314, 351) as claimed in claim 17 or claim 18, wherein the guillotine has a measuring means (103, 108, 114) in operable engagement with a clutch means such that when a predetermined distance has been measured by the measuring means, the clutch means couples the guillotine cutting head (101) to the guillotine drive means to operate the guillotine between the out of use position and the in use position and back to the out of use position effecting a chopping action by the guillotine cutting head (101).

20 20. An apparatus (301, 314, 351) as claimed in claim 19, wherein the measuring means is a wheel having wheel diameter adjustment means.

25 21. An apparatus (301, 314, 351) as claimed in any one of the preceding claims, wherein a trench generating means (341) is mounted on the tool receiving means of the adjustable working arm (3).

30 22. An apparatus (301, 314, 351) as claimed in claim 21, wherein the trench generating means comprises a wedge blade (341) having a leading edge blade (201) and a trailing edge having means for receiving material.

23. An apparatus (301, 314, 351) as claimed in any one of the preceding claims, wherein pipe dispensing means (211, 209, 212, 213) are mounted on the chassis (1) of the apparatus.

5 24. An apparatus (301, 314, 351) as claimed in claim 22 and claim 23, wherein the pipe dispensing means (211, 209, 212, 213) and the trench generating means are mounted on the apparatus for dispensing pipe (210) into the material receiving means of the trench generating means for drainage and/or irrigation.

10 25. An apparatus (301, 314, 351) as claimed in claim 24, wherein guide means (359) is mounted on the chassis (1) of the apparatus for guiding the pipe (210) from the pipe dispensing means into the trench via the material receiving means.

15 26. An apparatus (301, 314, 351) as claimed in any one of claims 21 or 22, wherein a material hopper (229) is mounted on the chassis and a material delivery means (230) is connected intermediate the hopper and the material receiving means of the trench generating means.

20 27. An apparatus (301, 314, 351) as claimed in any one of claims 21 to 26, wherein soil compacting means (220) are mounted on the adjustable working arm (3) to follow above the trench generating means (341) for flattening any uneven ground surface.

28. An apparatus substantially as hereinbefore described with reference to and as shown in the accompanying drawings.